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MCH-002

P.G. DIPLOMA IN ANALYTICAL CHEMISTRY (PGDAC)

Term-End Examination

00792

December, 2014

MCH-002 : SEPARATION METHODS

Time : 3 hours *Maximum Marks : 75*

Note : *Attempt any **five** questions. All questions carry equal marks.*

1. (a) Explain distribution law and its limitations in solvent extraction process.

(b) How will you classify the separation methods based on equilibrium processes ? *7, 8*

2. (a) Give details of solvent extraction by crown ethers.

(b) Discuss the influence of salting out and masking agents in the extraction process. *7, 8*

3. (a) Two substances X and Y were found to have retention time 18·50 and 19·80 min, respectively, on a 32·0 cm column. An unretained species passed through the columm in 1·10 min. The peak widths (at base) for X and Y were 1·20 and 1·30 min, respectively. Calculate

(i) column resolution

(ii) the average number of plates in the column and

(iii) the plate height.

(b) Discuss the principle and applications of paper chromatography. *8, 7*

4. (a) For gas chromatography, explain its applications and the Electron Capture Detector used.

(b) What do you mean by development of a column ? Explain the elution analysis technique. *10, 5*

5. (a) Write the applications of high performance liquid chromatography (HPLC) in pharmaceutical and biochemical disciplines.

(b) Draw a schematic illustration for Electrospray method interfacing of HPLC with MS. Explain it also. *8, 7*

6. Describe any ***three*** of the following : *5, 5, 5*

(a) Natural Ion Exchangers

(b) Synthesis of Cation or Anion Exchange Resins

(c) Amphoteric Ion Exchangers

(d) Ion Exchanger as catalyst

7. (a) Illustrate the synthesis, properties and applications of Dextran Gels.

(b) Describe Electrodialysis Membrane Separation Process and mention its applications also. *7, 8*

8. Write notes on the following : *5, 5, 5*

(a) Reverse Osmosis Process

(b) Ion Selective Membrane Electrode

(c) DNA Gel Electrophoresis